



sean mitchell &lt;[REDACTED]&gt;

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**PFAS & Firefighters**

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**John Washington** <[REDACTED]>

Fri, Sep 4, 2020 at 3:45 PM

To: [REDACTED]

Hi Sean,

Thursday was very busy and I am not working today, so this is my home email. Maybe it would be easier to talk on the phone sometime next week. How about if you text me at my cell to arrange a time to talk on Tuesday? Does this sound reasonable? My cell is [REDACTED].

I hope you enjoy Labor Day!

John

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**From:** Washington, John <[REDACTED]>**Sent:** Thursday, September 3, 2020 12:08 PM**To:** John Washington <[REDACTED]>**Subject:** FW: PFAS & Firefighters**From:** Sean Mitchell <[REDACTED]>**Sent:** Thursday, September 3, 2020 8:31 AM**To:** Washington, John <[REDACTED]>**Subject:** Re: PFAS & Firefighters

Hi John,

This is invaluable. To be able to reach out to the author of the publication, and receive such a thorough response is amazing and we greatly appreciate it. Also, I appreciate the additional documents you've provided.

Unfortunately, we have learned that the textile and turnout gear manufacturers use publications such as yours to support their claims that their products are completely safe. We were certainly struck by the fact that your study appeared to have nothing to do with textiles, especially textiles that will face the extremes related to fighting fire. I'm wondering if you would be willing to allow us to quote parts of your response so that we can assist other fire departments as they will undoubtedly be sent this publication in the future. I imagine many have already received it and assumed it was validation of those claims. We need to do all we can to put a stop to this and let the manufacturers know that we will no longer blindly accept these studies. We are starting to do the research ourselves, and any help we can get from independent, unbiased scientists such as yourself and your team, will give us a much needed advantage when trying to navigate this world of PFAS and other potentially harmful chemicals.

Cancer is now the leading cause of death in the fire service and we are doing all we can to eliminate the unnecessary exposures we face daily. We understand that PFAS chemicals are the best water and oil repellent compounds, but maybe we don't need the best if it also means we are exposing ourselves and our environments to both known and unknown dangers.

This link will take you to the Firefighter Cancer Support Network's website: <https://firefightercancersupport.org/>

I'm available to discuss this further anytime.

And, thank you for YOUR service!

Sean

On Wed, Sep 2, 2020 at 4:38 PM Washington, John <[REDACTED]> wrote:

Hi Sean,

First addressing your question regarding my 2015 ES&T paper on the biodegradation rate of fluorotelomer-based polymers (call these FTPs): *"Would you agree with the manufacturer that your research has proven that side-chain PFAS are not a concern for firefighters who will be exposed to their gear daily over a 32-year career? Is this study applicable to our situation?"* I am not a toxicologist nor a health professional, my position is as a research chemist. But speaking from my perspective as a chemist, no, I do not agree that my publication has proven that side-chain FTPs are not a concern for firefighters when the FTPs are in turn-out gear "exposed to extreme temperatures (both high and low), as well as degradation of the fibers due to exposure to sunlight, toxic smoke, the wash process, etc."

A few details:

- i) The paper you attached and that I mention above is for *biodegradation* (for example, if your old coat or an FTP-treated carpet was disposed in a landfill where microbes might grow on it).
- ii) But we have shown that commercial FTPs degrade by simple exposure to water alone at moderate temperature (see attached WashingtonJenkins 2015).
- iii) There also is this: when FTPs are applied to surfaces like turn-out gear, it is sprayed on as an aqueous solution with the FTP and surfactants. The surfactants are needed to keep the FTP stable in the water. Historically, the surfactants were PFAS at up to 2% by-mass concentration. Commonly when FTP-treated articles were new, they had much of the surfactant PFAS remaining on the surface like turn-out gear. If you have noticed new clothing often is more repellent than old, much of this effect is from the excess (non-FTP) PFAS. We showed this in our 2014 paper (WashingtonEtAl2014). See Figure 4 and the Supporting Information which is available free on-line or I can send it to you if interested. So more mobile PFAS might be much higher concentrations in newly treated products than aged.
- iv) As far as I know, the scientific community does not know whether (or which) new commercial FTPs (based on C6 rather than the older C8 of my papers) have the surfactant fraction comprised of PFAS as opposed to other types of surfactants. Perhaps the surfactants in new FTPs (C6 technology) might not be PFAS anymore – this might be a good question to pose. Regardless, my group hopes to study this in the near future.
- v) All my work in the paper you sent and that I attached is carried out at roughly standard temperature and pressure (25 C and 1 atmosphere pressure). How fast FTPs degrade under more extreme conditions remains uncertain as far as I know. I know for certain that my publications have not addressed extreme conditions.
- vi) As you probably are aware, fire-fighting foams also are potential PFAS sources for fire fighters. See for example the attached Jin et al. So whatever dose one might receive from new or aged turn-out gear potentially could be in addition to already elevated levels. Notice Jin specifically identifies perfluorohexane sulfonate (PFHxS), which is a C6 PFAS.
- vii) For me personally, I would be concerned about potential exposure when using fire-fighting foams that contain PFAS in vigorous situations.

viii) If I personally were to buy new turn-out gear and I was uncertain what kind of surfactants were used during FTP application (PFAS surfactants vs nonPFAS surfactants), I personally would consider letting the gear sit in the summer sunlight and winds for a week or so, during daylight hours while your crew can monitor it. I have not proven this might drive off surfactant PFAS (if present), but based on what I understand, I would hope so.

With all this stated, I am uncertain what other technologies there might be to help keep you and your brethren safe. The C-F bond is unique in important properties and it would be quite challenging to equal these properties with other molecules. And of course, one must always balance risks and benefits, one against the other.

I'm hope this helps in some small way. And thank you very much for your service!

Sincerely,  
John

**From:** Sean Mitchell <[REDACTED]>  
**Sent:** Wednesday, September 2, 2020 10:19 AM  
**To:** Washington, John <[REDACTED]>  
**Subject:** PFAS & Firefighters

Dr. Washington,

My name is Sean Mitchell and I'm a 16-year veteran of the fire service, currently serving as a Captain in my municipal fire department. I have recently been involved in research regarding PFAS in our turnout gear as we look to purchase the safest available option.

As part of my research I have contacted many of the textile and gear manufacturers. They generally state that C6 is well-studied and is proven to be a safe alternative to C8. Recently we received the attached study, which a manufacturer sent as scientific evidence that there is no exposure risk for firefighters who handle and wear turnout gear made using C6. I'm wondering if you would agree? Our turnout gear is exposed to extreme temperatures (both high and low), as well as degradation of the fibers due to exposure to sunlight, toxic smoke, the wash process, etc.

I'm hoping you would be able to offer some insight as far as this study is concerned. Would you agree with the manufacturer that your research has proven that side-chain PFAS are not a concern for firefighters who will be exposed to their gear daily over a 32-year career? Is this study applicable to our situation?

I appreciate your time is valuable. This is one of the most pressing issues facing firefighters today as we look to reduce our exposures as much as possible.

Thank you,  
Sean Mitchell